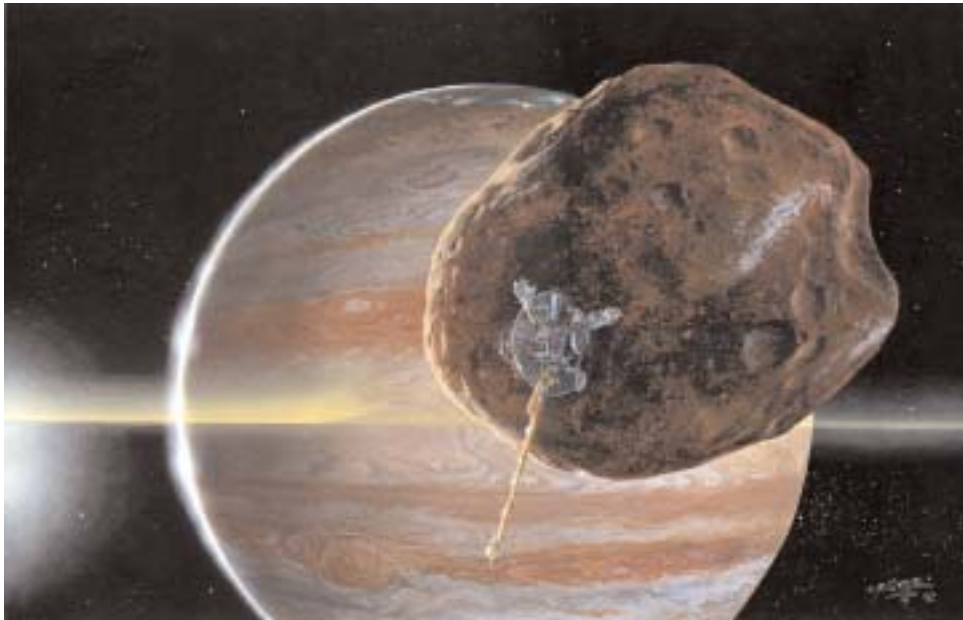


Galileo executes its final flyby

By Guy Webster

Artist's rendering shows
Galileo's approach to the
Jovian moon Amalthea.



JPL'S LONG-LIVED GALILEO

SPACECRAFT ACHIEVED PARTIAL SUCCESS IN A DASH THROUGH JUPITER'S INNER RADIATION BELTS AND PAST THE SMALL MOON AMALTHEA ON TUESDAY, ITS FINAL FLYBY BEFORE A DELIBERATE IMPACT INTO JUPITER NEXT SEPTEMBER.

THIS WAS GALILEO'S LAST FLYBY, AFTER 37 OTHER CLOSE ENCOUNTERS WITH VARIOUS PLANETS, ASTEROIDS AND JUPITER'S FOUR LARGE MOONS SINCE LAUNCH 13 YEARS AGO.

As the orbiter headed closer to Jupiter than it had ever ventured before, it gathered measurements of the energy fields and charged particles in the inner region of Jupiter's magnetic environment. It also examined dust grains that form a "gossamer" ring around the planet.

However, Galileo placed itself in a standby precautionary mode after its closest approach to Amalthea. It flew past Amalthea at a targeted altitude of 160 kilometers (99 miles), then went into "safe" mode about 30 minutes later. In that mode, onboard fault-protection software suspends many operations until

receiving further instructions from the ground.

"We knew this would be a challenging encounter for Galileo, so we are not surprised to have some things go awry," said Project Manager Dr. Eilene Theilig. "Not only was the spacecraft going through a region with more intense radiation than it had ever experienced before, but it was also doing this after it had already survived four times the cumulative radiation dosage it was designed to take and had already operated nearly five years past its original mission."

The flight team at JPL is working on recov-

ery operations, diagnosing what happened and preparing new commands to Galileo that will restore the orbiter to normal and enable the playback of scientific data stored on the spacecraft's tape recorder. Two tape tracks of science data were recorded during the encounter period, out of four tracks planned. Also, the intended type of two-way radio link with Earth for the period closest to the flyby was not achieved.

Now receding again from Jupiter, the spacecraft left the region of radiation danger about 11 hours after passing Amalthea.

Amalthea orbits about halfway between Jupiter and Io, the innermost of the planet's four large moons. Amalthea is an elongated body, about 270 kilometers (168 miles) long.

Galileo has nearly depleted its supply of the propellant needed for pointing its antenna toward Earth and controlling its flight path. While still controllable, it has been put on a course for impact into Jupiter. That's so there will be no risk of it drifting to an unwanted impact with the moon Europa, where Galileo discovered evidence of a subsurface ocean that is of interest as a possible habitat for extraterrestrial life.

Sixty-four minutes after speeding over Amalthea's cratered surface, Galileo passed within about 71,400 kilometers (44,366 miles) of Jupiter's cloud tops. That marked the beginning of Galileo's final orbit, which will end with a plunge into the crushing pressure of Jupiter's atmosphere on Sept. 21, 2003.

Going into a standby mode does not jeopardize Galileo's disposal at Jupiter. No further commanding of the spacecraft is necessary to assure that it is on an impact trajectory, Theilig said.

Stardust's Annefrank flyby successful

By Guy Webster

Asteroid Annefrank is
seen as irregularly shaped,
cratered body in an
image taken by Stardust
during a Nov. 2 flyby.

All systems on JPL's Stardust spacecraft performed successfully when tested in a flyby of asteroid Annefrank on Nov. 1, heightening anticipation for Stardust's encounter with its primary target, comet Wild 2, 14 months from now.

As a bonus, Stardust discovered that Annefrank is about twice the size anticipated, but with a dimmer surface. The dimmer surface increased the challenge of sighting the object as the spacecraft approached.

The Annefrank flyby offered a unique opportunity to thoroughly test all the operations planned for the encounter at Wild 2, where Stardust will collect samples from the cloud of dust around the comet for return to Earth. "We performed a full dress rehearsal with the cometary dust collector deployed, the spacecraft poised in its flyby attitude and with all science instruments on," said Stardust's principal investigator, Prof. Donald Brownlee of the University of Washington.

The spacecraft passed within about 3,300 kilometers (2,050 miles) of Annefrank. Engineers at JPL and at Lockheed Martin Space Systems-Astronautics in Denver ran the operation through the hours before and after the closest approach. The approach geometry was more difficult than it will be at Wild 2 because of the angles toward the Sun and Earth relative to the angle toward the asteroid. "The spacecraft performed every command perfectly," said Allan Cheuvront, Stardust spacecraft systems engineer at Lockheed. "Its performance under these severe conditions was outstanding."

"It was a challenge for the navigation camera to see Annefrank during approach," said JPL's Ray Newburn, lead scientist for the camera. The predicted brightness of Annefrank was near the lower limit of

PIA02885



what the camera can detect. Engineers tried techniques such as taking multiple long exposures and adding them together, said Dr. T.S. Mike Wang, optical navigation specialist at JPL. "Annefrank was not cooperating," Wang said. "It was just too dim."

The encounter images show Annefrank to be irregularly shaped, cratered, and about 8 kilometers (5 miles) in diameter. Stardust's dust instruments were on for the encounter, although no dust was anticipated. Scientists are still checking data to see if, by chance, the instruments may have seen a dust particle. "The dust flux measurement instrument ran for at least 27 minutes and performed all expected functions," said Dr. Tom Economou of the University of Chicago, lead scientist for that instrument. The lead scientist for Stardust's interstellar dust analyzer, Dr. Jochen Kessel of Max Planck Institute, Garching, Germany, said the Annefrank experience will enable him to put the German instrument into an even better configuration at Wild 2.

"Performing such flight testing before the primary encounter is a critical part of reducing risks and significantly increasing the probability of success at the primary target, Wild 2" said Stardust Project Manager Tom Duxbury. "We learned a lot that will improve our operations at Wild 2 based upon the lessons learned at Annefrank, but the bottom line is that if Annefrank had been Wild 2, we would have succeeded."

News Briefs



PIA03878

Reddish spots and shallow pits pepper the enigmatic ridged surface of Europa in this view combining information from images taken by Galileo during two different orbits around Jupiter.

Saturn as imaged by Cassini in October.

Galileo observes Europa 'lava lamp'

Reddish spots on the icy surface of Jupiter's moon Europa may indicate pockets of warmer ice rising from below. This upwelling could provide an elevator ride to the surface for material in an ocean beneath the ice, say scientists studying data from JPL's Galileo spacecraft.

"Europa acts like a planetary lava lamp, carrying material from near the surface down to the ocean, and, if they exist, potentially transporting organisms up toward the surface," said DR. ROBERT PAPPALARDO, a planetary scientist at the University of Colorado, Boulder.

Galileo, orbiting Jupiter since 1995, has produced strong evidence that Europa has a deep ocean of melted saltwater underneath a surface layer of ice. During the recent annual meeting of the Geological Society of America, scientists discussed interpretations of Europa data and proposals for future exploration of that world.

A Galileo color image of the spots, which are called by the Latin term for freckles, "lenticulae," is available online at <http://photojournal.jpl.nasa.gov/catalog/PIA03878>. Information about the mission and its discoveries is online at <http://galileo.jpl.nasa.gov>.

Cassini captures Saturn image

A successful test of the camera on JPL's Cassini spacecraft has produced images of Saturn 20 months before the spacecraft arrives at that planet. The image shows the shadow of the planet



PIA02884

falling across its famous rings and includes Saturn's largest moon, Titan. The planet was 285 million kilometers (177 million miles) from the spacecraft when the images were taken in late October, nearly twice the distance between Earth and the Sun.

"This is an emotional event for the mission," said DR. DENNIS MATSON, Cassini project scientist at JPL. "We now have Saturn in our sights."

"Cassini has sighted the ringed planet looking distant, mysterious and serene," said DR. CAROLYN PORCO, a planetary scientist at Southwest Research Institute in Boulder, Colo., and leader of the science team using the Cassini camera. "Our anticipation has been building for years, so it's good to know our destination is in view."

Cassini camera-team member DR. ALFRED MCEWEN at the University of Arizona added, "Seeing the picture makes our science-planning work suddenly seem more real. Now we can see Saturn and we'll watch it get bigger as a visual cue that we're approaching fast. It's good to see the camera is working well."

Fourteen camera-team scientists selected by NASA will use the camera to investigate many features of Saturn, its moons and its rings. Cassini will begin a four-year prime mission in orbit around Saturn when it arrives on July 1, 2004. It will release a piggy-backed probe, Huygens, to descend through the thick atmosphere of Titan on Jan. 14, 2005.

A color composite of the Saturn images is available online at <http://photojournal.jpl.nasa.gov/catalog/PIA02884>.

Students to name 2003 rovers

NASA has announced its participation in a contest that will give Ameri-

can school kids a chance to name the two rovers being launched by JPL next year to explore Mars.

The robotic explorers are part of NASA's upcoming Mars Exploration Rover (MER) mission. The twin rovers will land at two different locations on the mysterious red planet to explore the surface in search of answers about the history of water on Mars.

The "Name the Rovers" contest is a collaborative effort between NASA and the Lego Company. Lego will manage the contest in conjunction with The Planetary Society. The contest provides students with the unique opportunity to suggest a name for each of the two Mars-bound rovers, temporarily known as MER-A and MER-B. The rovers are scheduled to launch in May and June 2003, respectively. The rovers are scheduled to land on Mars in January 2004.

"We are very excited about providing students with an opportunity to actively participate in the next mission to Mars," said DAVE LAVERY, program executive for solar system exploration at NASA Headquarters. "We are eagerly looking for some really creative and innovative ideas from the students as they compete to name the next Mars rovers and become part of history."

The contest is open to students 5 to 18 years of age who attend a U.S. school and are enrolled in the Fall 2002 school season. Submissions must include suggested names for both rovers and a 50- to 500-word essay justifying why the students believe the names should be chosen. The contest has many educational benefits and encourages students to do research for their essays and to learn more about Mars and space exploration.

The contest is open for submissions through Jan. 31, 2003. NASA will announce the contest winners prior to launching the rovers in spring 2003. For more information, visit <http://www.nametherovers.org>.

Enroll for benefits through Nov. 14

Benefits-eligible JPL employees may review their current insurance coverages and make changes for the year 2003 via the Oracle Web Applications system (the same web site employees use for timekeeping). Log on to <http://nbs>.

Information packages have already been sent to employees. These packages include a summary of benefit changes for 2003, new rates and plan comparison, as well as instructions on how to use the web to verify your current benefit elections and submit changes. Please review this information carefully.

If you haven't already done so, you may want to consider some things before you enroll, such as:

- How well did your choices work for you in 2002?
- Are there dependents you need to enroll or delete from coverages?
- Do you need to increase or decrease your life insurance for yourself or your dependents?
- Did you defer too much or too little into your Health Care and/or Dependent Care Spending Accounts for 2002?

To assist employees in making informed choices about medical and dental coverage options and to answer any other questions, representatives from the Benefits Office and each of JPL's medical and dental insurance carriers will be on Lab on Friday, Nov. 8, 1 to 3:30 p.m., 180-101 conference room, and Wednesday, Nov. 13, 10:30 a.m. to 3 p.m., on the mall.

If you are making no changes to your current benefit selections for 2003, you do not need do anything. Your elections will remain the same in 2003. However, if you currently have a Health or Dependent Care Spending Account and wish to participate in one next year, you must re-enroll.

For more information, check the Benefits Office's home page at <http://eis.jpl.nasa.gov/hr/benefits/benefits.htm> or call ext. 4-3760.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meetings are available. Call the Employee Assistance Program at ext. 4-3680 for time and location.

Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (The Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680.

Codependents Anonymous—Meeting at noon every Wednesday. Call Occupational Health Services at ext. 4-3319.

Gay, Lesbian and Bisexual Group—Meets the first and third Fridays of the month at noon in Building 111-117. Call the Employee Assistance Program at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Working Parents Support Group—Meets the third Thursday of the month at noon in Building 167-111 (The Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680.

Friday, November 8

"What's the Color of Funny? Race, Society, and Comic Strips"—Aaron McGruder, creator of the Boondocks comic strip, will speak at 8 p.m. in Caltech's Beckman Auditorium. Admission is free. For more information, call (626) 395-4652.

Fri., Nov. 8–Sun., Nov. 10

Double Infidelity—The play by Mari-vaux will be performed by Theater Arts at Caltech Friday and Saturday at 8 p.m., Sunday at 2 p.m. Tickets are \$15. Call (626) 395-4652.

Saturday, November 9

Folk Music—Singer/songwriter Cosy Sheridan will appear at 8 p.m. in Caltech's Winnett Lounge. Tickets are \$12 for adults and \$4 for children under 12. For more information, call (626) 395-4652 or check the Folk Music Society website at <http://www.folkmusic.caltech.edu>.

Tuesday, November 12

Investment Advice—A Fidelity representative will be available for one-on-one counseling in T1720-131. For an appointment, call Fidelity at (800) 642-7131.

JPL Stamp Club—Meeting at noon in Building 183-328.

Wednesday, November 13

JPL Amateur Radio Club—Meeting at noon in Building 238-543.

JPL Toastmasters Club—Meeting at 5 p.m. in the 167 conference room. Call Roger Carlson at ext. 4-2295.

Thursday, November 14

JPL Stories—Charley Kohlhasse, Mars Program consultant and former Cassini science and mission design manager, will present "Bits of This and That," at 4 p.m. in the customer service area of the Library, Building 111-104. The talk will highlight six special topics: Building Missions, Public Engagement, Virtual Reality, Art and Science, Changes at JPL Since 1959, and Earth's Greatest Problem. If you have questions about the JPL Story series or wish to participate, call Teresa Bailey at ext. 4-9233.

Fri., Nov. 15–Sun., Nov. 17

Double Infidelity—The play by Mari-vaux will be performed by Theater Arts at Caltech Friday and Saturday at 8 p.m., Sunday at 2 p.m. Tickets are \$15. Call (626) 395-4652.

Saturday, November 16

Caltech-Occidental Symphony Orchestra—The program for this concert will feature Montsalvage's Cinco Canciones Negras and Dvorak's Symphony No. 6. Call (626) 395-4652.

Stephen Wolfram—The creator of *Mathematica* will appear at 8 p.m. in Caltech's Ramo Auditorium to describe ideas and discoveries from his book "A New Kind of Science," their implications for various fields of science, and their personal and historical context. An extended question-and-answer period will be included. Admission is free. For more information, call (626) 395-4652.

Tues., Nov. 19–Wed., Nov. 20

Investment Advice—A TIAA/CREF representative will be available for one-on-one counseling. For an appointment, visit <http://www.TIAA-CREF.com> or call (877) 209-3140, ext. 2614.

Thursday, November 21

Caltech Architectural Tour—The Caltech Women's Club presents this free service, which is open to the public. The tour begins at 11 a.m. and lasts about 1 1/2 hours. Meet at the Athenaeum front hall, 551 S. Hill St. For reservations, call Susan Lee at (626) 395-6327.

Social Security—A representative will be available for one-on-one counseling. Call the Benefits Office at 4-3760 for an appointment.

TIAA/CREF Workshops—"Planning Retirement Income," from 10 a.m. to noon, will help answer such questions as How much money is enough? What are my retirement income options? When and how can I begin receiving income? An enrollment meeting will be offered at noon to assist employees newly eligible for the Caltech/JPL TIAA/CREF retirement plan with selection of investment options and the completion of enrollment forms. "Getting Organized," to be held from 1 to 3 p.m., will cover setting goals and determining obstacles; overcoming obstacles and closing the saving gap; financial security; replacement ratio and retirement income; and cash flow, income and expense analysis. All will be held in Building 180-101.

Von Kármán Lecture Series—Dr. Richard Terrile, JPL Mars Scout program scientist, will present "Rise of the Machines: Intelligent Robots and Space Exploration" at 7 p.m. in von Kármán Auditorium. This presentation will give an overview of the current and future plans for exploring our solar system with robotic spacecraft. For more information, see <http://www.jpl.nasa.gov/events/lectures/nov02.html> or call Public Services at ext. 4-0112.

Friday, November 22

Von Kármán Lecture Series—Dr. Richard Terrile, JPL Mars Scout program scientist, will present "Rise of the Machines: Intelligent Robots and Space Exploration" at 7 p.m. in the Vosloh Forum at Pasadena City College, 1570 E. Colorado Blvd. See above listing for further details.

Fri., Nov. 22–Sun., Nov. 24

Double Infidelity—The play by Mari-vaux will be performed by Theater Arts at Caltech Friday and Saturday at 8 p.m., Sunday at 2 p.m. Tickets are \$15. For more information, call (626) 395-4652.

Saturday, November 23

Caltech-Occidental College Concert Band—A free concert will be offered at 8 p.m. in Beckman Auditorium. The featured artist is Jay Easton, who will play one of the largest saxophones ever made. Music by Shostakovich, Sousa, and Alfred Reed will be included. For more information, call (626) 395-4652.



40 Years Ago

Harper's Bazaar publicity photo with Dr. Pickering, two technicians, and model, October 1962.

Optical Interferometry Development Laboratory

O I D L

NEW INTERFEROMETRY LAB TO AID IN THE SEARCH FOR STARS AND PLANETS

Getting closer to our neighbors

BY MARK WHALEN

THE SEARCH FOR PLANETS beyond our solar system has received a major boost with the dedication of JPL's Optical Interferometry Development Laboratory.

Located across the street from the Caltech Credit Union, the new Building 318 was christened on Nov. 4. JPL Director Dr. Charles Elachi and the Executive Council welcomed guests that included U.S. Rep. Adam Schiff (D-Pasadena) and Pasadena Mayor Bill Bogaard.

"The Optical Interferometry Development Laboratory will allow us to invent the tools for a new era of discovery," said Michael Devirian, program manager, Origins and Astrophysics Office.

"Imagine if every star had a planet like our planet," said Elachi. "Interferometry is one of the key technologies that will allow this type of discovery, and the new building will be critical for the development of this technology."

The facility was designed with the capability of building the next generation of space instruments that will not only find those far-off planets, but also to take pictures of them and measure the molecules in their atmosphere for the signs of life.

The Optical Interferometry Development Laboratory comprises five buildings linked together so that a movement in any location will not cause vibrations that spoil delicate instruments and experiments in any of the laboratories. Temperatures are held constant and the air is held still.

The new facility meets extremely demanding criteria for control of temperature, humidity, vibration and noise sufficient for development of picometer-class control technology. The building is a 1,346-square-

meter (14,500-square-foot) structure containing a 458-square-meter (4,930-square-foot) high bay with an 11-meter (36-foot) ceiling, a 185-square-meter (1,990-square-foot) ground support equipment room, and three development laboratories, each at 219 square meters (2,360 square feet).

Facilities Manager Bruce Fischer also pointed out that "this is undoubtedly the first building constructed in NASA in which the design emphasized durability in materials in equipment and was designed to minimize maintenance costs."

Indeed, the Laboratory was awarded a rebate check of more than \$48,000 last month by Southern California Edison for the installation of energy-efficient equipment in the building.

The new facility was needed because previous development-laboratory space on Lab was inadequate and personnel overflowed facilities that are scattered across the Laboratory. The location of the new building, in the vicinity of buildings 171, 301 and 306, was needed to cluster it in proximity with existing vibration-isolated and clean environments used for interferometry development. Building 306 is capable of nearly comparable vibration isolation, but its space is fully occupied by preliminary interferometry technology development, as well as hardware dedicated to other flight missions.

The building will begin occupation later this month.

"It will be nice to have the interferometry team co-located together," said Astronomy and Physics Director Larry Simmons.

The facility will support the following missions, among others:

THE KECK INTERFEROMETER in Hawaii, which links two 10-meter (33-foot) telescopes to form the world's most powerful optical telescope system. They will be used to search for planets around nearby stars.

THE SPACE INTERFEROMETRY MISSION, which will detect planets in size from a few Earth masses to Jupiter-mass. It will analyze the wobbling motion the planets induce in their parent stars to detect planets. The mission will determine the positions and distances to stars several hundred times more accurately than is possible today with the best telescopes. Launch is proposed for 2009.

THE JAMES WEBB SPACE TELESCOPE, which will carry a near-infrared camera, a multi-object spectrometer and a mid-infrared camera/spectrometer. The mission will help astronomers understand how galaxies first emerged out of the darkness that followed the rapid expansion and cooling of the universe just a few hundred million years after the Big Bang. The mission is scheduled for launch in 2010.

THE TERRESTRIAL PLANET FINDER, which will feature formation-flying interferometers and will be capable

of detecting and characterizing Earthlike planets around as many as 200 stars up to 45 light-years away. The mission's proposed launch is in 2014.

The JPL project team included Carl Simon, project manager; Scott Susoeff, construction manager; Alden Jenkins, electrical construction manager; Vince Bethel, mechanical construction manager; Mike Salsman, contract negotiations; Brad Walker, safety; and Alison Weisbin, environmental. Architecture and engineering was handled by the firm of Widom, Wein, Cohen, O'Leary, Terasawa, and the building contractor was OC America Construction, Inc.

Michael Shao, leader of JPL's Interferometry Center of Excellence, noted that the interferometry program has grown from just four or five people to about 150 today. "The technological progress being made in interferometry over the last few months is outstanding," he said. "This new facility will be very valuable for the future of our research."

To commemorate the event, Schiff presented JPL with a certificate of recognition from the U.S. Congress. "Thank you for the extraordinary work you do every day," he told the gathering.

Left to right: Dr. Anne Kinney, director of the Astronomy and Physics Division in NASA's Office of Space Science; Congressman Adam Schiff; JPL Director Dr. Charles Elachi; Pasadena Mayor Bill Bogaard; Dr. Michael Shao, leader of JPL's Interferometry Center of Excellence; and Michael Devirian, program manager, Origins and Astrophysics Office.

PHOTOS BY DUTCH SLAGER / JPL PHOTO LAB

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Online for the JPL community

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JPL's online news source

View this and previous issues of Universe online
<http://universe.jpl.nasa.gov>

Universe is published every other Friday by the Office of Communications and Education of the Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109.

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Ads are due at 2 p.m. on the Monday after publication for the following issue.
All housing and vehicle advertisements require that the qualifying person(s) placing the ad be listed as an owner on the ownership documents.

Halloween fun



Photo by Bob Brown / JPL Photolab



Bob Brown



Bob Brown



Photo by Bob Brown / JPL Photolab



Photo by Richard Hasewgawa / JPL Photolab

Letters

To my JPL friends, past and present co-workers of Section 311, I would like you to know how much I appreciated your presence at my retirement party on Wednesday, October 23. It was a wonderful get together and one that I shall always remember. I have had many happy years at the Lab and will miss you all and the exciting space successes. Many thanks and best wishes to all of you.

Fran Mulvehill

We would like to thank all of our wonderful friends, colleagues, and Section 354 for the cleverly planned surprise to celebrate our marriage. The party, cake, kind words, and advice made for the perfect send-off and the generous cash gift will be put to good use. A special thanks to Lori for putting everything together and to Jeff and Marie for getting us there. We had a great time.

Matt and Brenda (McDonald) Dudik

My family and I would like to thank the colleagues and friends of Charles for their prayers, cards and gifts that were received after his passing. ,

Amelia Crawford and four daughters

Passings

DOROTHY SANDERS, 78, a retired secretary, died from complications of cancer Oct. 19.

Sanders worked at JPL for 26 years, retiring in 1986. She is survived by her husband, Densmore. Services were private.

Classifieds

For Sale

- BIKES, boy's, Huff, \$45, girl's, \$15, both very good cond.; PLATES, 20-25, collectible porcelain, \$30. 626/359-7666.
- COFFEE MAKERS, Krups 10-cup, white/gray, like new, \$40/obo; Braun 10-cup, white/black, like new, \$30/obo. 626/791-6101.
- COMPUTER MONITOR, 21", Nokia 445Xi, 19.7" viewable; DINING TABLE, 60" x 30", solid maple, not veneer, butcher block type, satin urethane varnish, \$100/ea. 626/798-4740.
- COPIER, Canon PC 420, has new toner cartridge, \$60. 626/791-8161.
- COUCH, shades of gray/blues, with Oak Trim, \$200/obo; DESK, white, \$50/obo. 626/294-1927.
- DRYER, electric, heavy-duty large capacity, good cond., \$115. 648-4846, Mike.
- FAX MACHINE, Sharp UX-510, w/manual, \$30. 626/791-8161.
- FURNITURE: desk, Spanish oak, and 2 matching bookcases, \$700; mission sideboard w/mirror, \$1,200; mission library desk, \$400; office furn., Techline, white, 6 pcs, \$500; hall table, drop leaf, \$250; butcher block utility table, unfn., \$200; several mirrors, Span. hand-made rug, bright colors, \$250; Nordic-Track, orig., \$50. 626/584-0860, Donna.
- FURNITURE: recliner, teal, \$49; peacock chair, wicker, \$29; coffee table, oak, \$19; 3-shelf bookcase, white, \$19; baby crib, maple \$29; stroller, pink and gray, \$19; microwave cart, solid oak, \$39; matching oak side table, \$19; water dispenser (hot and cold), stand-alone model, \$29. 626/798-4510.

- GUITAR, Takamine acoustic, 6 string, with case, \$300/firm. 626/294-1927.
- MACHINIST ROLLER CABINET, Kennedy, 6 drawer, 27", wrinkle brown, exc. cond., \$300/obo; GPS DEVICE, Garmin etrek, \$60; CLIMBING GEAR, set of small and large black diamond nuts racked on 2 carabiners, \$55; SLUNG HEXES, set, \$50; ASSORTED SLINGS, \$10; HOME SPEAKERS, Pioneer, CS-E350 \$20. 500-1543.
- MISC: quilting frame, \$29; SuperDisk external disk drive for Mac, \$49; spare tire/wheel T105 80D-13, donut, used once, \$39; Shiatsu massager, fits in chair, \$39; mini-blinds 72" w x 50", 2 for \$29; wireless doorbell/intercom \$39; golf ball retriever, telescoping alum. 12", \$19; rolling duffel bag, kids, multicolor, never used, \$19; 3-pc. luggage set, P. Cardin, \$19. 626/798-4510.
- MINI-DISC PLAYER, with record capability, Sony, remote, 10 blank discs, great sound, tiny, mint cond., \$145/obo. 687-8627, Alberto.
- MOUNTAIN BIKES, 2, Raleigh, 14.5in frame, good cond., \$40/ea. 248-0638, after 6pm, Paul.
- RANGE, GE dual oven electric, 42", beige, exc. cond. 601-0089, day, 952-3008, eve., Joseph.
- REFRIGERATOR, 1998 Kenmore, 20.5 cu. ft., bottom freezer, auto defrost, white, humidity control, vg cond., in Altadena, orig. cost over \$800, sell for \$375. 626-355-4447.
- SCREEN, wicker, 3-panel, natural rattan, 72" high x 54" wide, \$60; TYPEWRITER, Smith-Corona electric, with memory \$50; PLANT STAND, indoor/outdoor, white coated metal, 29" high x 14" wide x 12" deep, still in box, \$10. 352-3112.
- SURFBOARD, 7'11", Rusty, \$95; DVD, Philips, \$100; BRIEFCASE, alum. Zero-Halliburton, \$195; CALCULATOR, TI-83 Plus, \$50. 626/844-9228.
- TELEVISION, 16" screen, Hitachi, exc. cond., w/remote, wood frame, \$100. 626/794-4921.
- TREES: fish tail, 6' tall, \$80/obo; Ficus, braided, in 30" plastic pot >10' tall, \$250 obo; Ceramic bowl, gray, 2' diameter with planted geraniums, \$40 obo. 626/791-6101.
- VACATION CLUB MEMBERSHIP, Silverlakes, Calif., resort, golfer's dream, 4 weeks free golf anytime each year, 2 bd. condo for up to 6 people, two lakes, many amenities, private PGA rated course with driving range and putting greens, less than 2 hours from Pasadena, exchange rights with 3,000 resorts, reduced to sell due to illness, \$15,000. 805/967-7725.
- WASHER/DRYER, stacked, Maytag, gas dryer, white, used less than 3-years, \$500/obo; BABY CRIB, custom, and changing table, blue with Noah's Ark theme, \$250/obo. 626/564-1196.

Vehicles / Accessories

- '92 ACURA Integra LS, hatchback, red/automatic, 120K mi., orig. owner, well-maintained, new tires, all service records, pwr. windows, cruise control, am/fm/tape, tilt wheel, int. trunk and gas release, \$5,800. 562/420-2313.
- '89 BUICK Century, 108K mi., air, cruise, pwr. acces., very clean, good running, reliable transportation, \$1,600. 790-1739.
- CABLE CHAINS for 255 70R16 tires, all steel construction, extra heavy duty side cables and carbon steel spring rollers, chain tensioners included, easy installation, exc. cond., used twice, \$45/obo. 353-6369.
- CARGO LINER, for Ford Explorer '98-2000, 4 dr. models, gray Dupont cordura "Line-a-Trunk" by Rear Gear protects cargo area floor, side walls, wheel wells, rear seat backs and tailgate; see www.urbanjunglesuv.com/rear_gear_urban_jungle.htm, exc. cond., \$65/obo. 353-6369.
- '92 CHEVROLET Cavalier RS, 135,000 mi., good cond., brand new breaks and battery, \$1,200. 626/396-1945.
- '00 COACHMAN Futura travel trailer, 28 ft, model 2790TB, all welded aluminum frame, very light for its length at 4,366 lbs, sleeps 6, 2 bunks, queen bed, used less than 10 times, covered at all times, \$16,500. 661/255-7958, eves.
- '99 FORD Taurus, like new, silver, 75,000 mi., new tires, \$5,200. 626/379-3503.
- '99 FORD Taurus Wagon, metallic silver, great spacious family car, 12 valve V6 3.0 L engine, 79K mi., exc. cond., \$8,300/obo. 626/584-1164.
- '68 FORD Mustang Classic Calif. Special GT/CS, hi-perf. 302 cid, 75K orig. miles, auto, fac. a/c, PS, AM radio, metallic gold paint, black interior, GT hood, trunk, fogs and wheels, no rust, turns heads, \$13,250/obo. 626/963-5727.
- '99 HONDA Accord LX, exc. cond., tan interior, champagne color, radio/cassette, a/c, 51,000 miles, \$12,995/obo. 626/584-7668 or 818/956-0014, Marlyn.
- '94 HONDA Nighthawk 250cc, 2,500 miles, exc. cond. kept in garage, \$1,500. 562/693-1136.
- '91 HONDA Prelude SI, black, drives well, a great car, 235K miles, Kelley Blue Book estimates \$2,925, sell \$2,500/obo. 310/822-

8068, leave message.

- '85 HONDA Accord sedan, good cond., well maintained. 4 dr., automatic, white w/blue interior, 167K mi., \$1,850. 626/914-7853.
- '85 KOUNTRY Lite 5th wheel trailer, 30 ft., orig. owner, alum. frame, 13.5K mi., a/c, side bath, microwave, TV/VCP avail, new tires & water pump, sleeps 6, exc. cond., renewed lic.-Mar. \$6,500/obo. 626/963-5727.
- '94 MAZDA MPV V6, auto, air, pwr., 85K, exc. cond., \$4,700. 541-1408, David, weekends.
- '90 MAZDA Protege SE, 5 spd. man., 4 dr. sedan, 198K mi., a/c, gd tires, smogged, 2nd owner, grt around-town car, \$800. 626/864-6365.
- PICKUP TRUCK COVER, for S10 or Sonoma, Tonneau, white, dual locks, clamp-on installation and carpeted, \$600. 991-7245.
- '94 SATURN SL2, 5 spd. manual, alarm, upgraded sound system, Alpine detachable faceplate, AM/FM/cassette, 6 CD changer, 16" wheels, sunroof, great cond., \$3,200/obo, 714/445-3456 or 714/327-4671.
- '01 TOYOTA Rav 4, 2 WD-power, silver, windows, door locks, CD player, air, 5 speed, 10,300 mi., \$15,800. 260-0651.
- '01 TOYOTA Corolla, price reduced, sport trim, exc. cond., only 22K mi, 5 spd., silver, alloy wheels, CD player, a/c, pwr. everything, all dealer service, still under orig. manuf. comprehensive & powertrain warranties, fun to drive, ready to look/run great for many years, moving, must sell, \$11,850. 626/396-1945, lv msg.
- '01 VOLKSWAGEN Beetle GLS, silver/black leatherette, 5 spd., pwr. locks/windows/mirrors, cruise, alloys, AM/FM cass., CD changer, fog lights, ABS, remote keyless entry, 11K mi., \$16K. 626/449-0997.
- '78 VOLKSWAGEN Beetle, convertible, white w/ black top and interior, exc. cond., car has spent entire life in L.A. area, second owner has all receipts from orig. owner, \$7,800. 661/313-6144.

Wanted

BASKETBALL HOOPS, portable w/stand, for Loma Alta elem. students in Pas. district, any size, donations tax-deductible. 626/791-2574.

MUSIC STAND, non-folding type. 805/338-3064 or donandellen1@earthlink.net.

ROOF BOX, any sz., gd. cond. 626/584-1164.

SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman.

VIOLINS for Loma Alta students in Pas. district; full, 3/4, and half-sizes needed, any cond., donations are tax-deductible. 626/791-2574.

VOLLEYBALL PLAYERS, coed, no beginners please, Tues. nts., 8-10 at Eagle Rock High School, \$3/nt. 956-1744, Barbara.

Free

- CAT, gray Tabby kitten, med length hair, litter trained, healthy, very playful, friendly; mother cat also needs a home, 1 yr old. 626/287-9433.
- CAT, inquisitive, affectionate, neutered, dark, short-haired tabby male with good disposition, wonderful purr. 2-3 yrs old, found injured in road in August, now completely healed, healthy and grateful, can't stay here, would like loving home. 626/798-3235, Lori.
- DOG, 1 year old, male, black Labrador, neutered, needs lots of love and attention, great athletic dog, loves water, running, playing and all around exercise. 626/290-6199, Edgar.

Lost & Found

Lost: HAIR BARRETTE with marcasites, sentimental value. Ext. 4-9385.

For Rent

- ALTADENA, room, kitchen priv., washer/dryer, pool, share ba., \$400. 626/345-0692.
- ARCADIA, 1 bd., 1 ba. apt, 3-unit bldg., a/c, washer/dryer in unit, garage, remodeled kitch., walking distance to shops, supermarkets, bus stop; nice, residential neighborhood, \$875. 626/576-7333.
- BURBANK, 2 bd., 2 ba. apt., upper unit in small, quiet bldg., C/A, stove, dishwasher, \$900. 848-7515, Elaine, after 5 p.m.
- LA CANADA, private rm. in home, private bath, off-street parking, BBQ, pool, full kitchen priv., wash/dry, etc., \$450 + utilities. 952-5430.
- MONTROSE, 1 bd., 1 ba. condo to lease in Stancress, nr. Montrose shops, Vons, theater, hiking trails, grnd. flr. by pool/spa, great shaded patio, wash/dry in unit, fireplace. two exer. rms., entert. rm., woodshop, 2 plng. spots in secure garage, avail. early Nov., \$1,275. 790-4097.
- PASADENA, back house, 2 bd., 10 mins from

- JPL, no pets, one person, stove, fridge, micro incl., very clean, \$1,000. 626/795-3608.
- PASADENA, 2 bd., 2 ba., cent. heat/air, 2 parking spaces, close/JPL. \$1,000. 626/304-0065.
- PASADENA, 3 bd., 1 ba., garage, stove and fridge provided, no smoking, no pets, 1754 Corson St., drive by, pick up brochure, then call for appointment, \$1,495. 626/798-4510.
- PASADENA studio, great location, walking dist. to Paseo Colorado, Lake Ave. shops, 2 blocks south of Colo.; built-in refrig., tabletop stove, built-in desk and shelves, closet organizer, full bath; under-ground, gated parking; washer/dryer on site, quiet bldg; must undergo credit check w/property mgmt. company; water, trash incl.; \$660. 626/354-3647, Sheri Kang or Ben Yau, or sherikang@aol.com.
- PASADENA, spacious 2-story condo, 3 bd., 2.5 ba., prestigious community, beaut. inter., bright kitch., prof. landscape, ctrl. air & heat, close to shop., cozy l/r w/FP, end unit, frml. d/r, hdwd. flrs., immac. cond., close to schls, \$1,750. 626/396-9024.
- SIERRA MADRE, house w/2 apartments; ground floor has huge living room, 2 bd., one ba., and a garden, \$1,250; second floor has mountain views, 3 bd., 1 ba., \$1,450. 626/798-7755.
- SIERRA MADRE, townhouse-style apt. to share, 1,000 sq. ft., lg. patio, 2 bd., 1.5 ba., quiet st., garage parking, washer and dryer for this unit, \$615 plus 1/2 utilities. 626/355-4838, Heather.
- SLYMAR, rent to own, new, 5 bd., 3 ba., \$10,000 credit after one year, home under construction, 2,000 sq. ft. 626/584-6526.
- SUNLAND, fully furn. room in condo, share kitch., bath & laundry, garage parking, a/c, fireplace, pool, Jacz., tennis court, 10 miles to JPL, prefer male, non-smoking, no pets, \$450 + half utilities, security deposit; references. 352-3112.

Real Estate

- LA CAÑADA home, attractive, well-maint., 3 bd., 1.75 ba., 1855 sq. ft. on approx. 1/4 acre level lot, living & dining area, family room, 2 fireplaces, newer cent. heat & a/c, newer roof, copper plumbing, updated appliances, beautifully landscaped, auto-sprinklers, on sewer, detached 2-car garage & separate workshop/storage, walk to schools & JPL, \$719K. 952-0421.
- NE PASADENA, Lower Hastings, 3 bd., 2ba., well-maint, family home with large, grassy backyard on 10,800 sq ft lot, central heat and a/c, ceiling fans, recently remodeled baths, fully permitted 260 sq. ft. workshop could be converted to an office, curb appeal, great neighborhood, convenient to shopping, schools, and Gold Line station, \$529K. 626/355-5060 or 626/695-0535.
- SYLMAR, spacious 3 bd., 2 ba. house in quiet residential area, a/c, outdoor Jacuzzi, fireplace, 1,400 sq ft. + 2-car garage, must see, must sell, \$269,950/obo. 833-8490, Mike.

Vacation Rentals

- CANCUN, 5 star resort, 7 days, next to Ritz Carlton beachfront, full kitchen, sleeps 7, avail. 11/23-30/02. 601-0089 day, 952-3008, eve., Joseph.
- COSTA RICA, Pueblo Real, Quepos, 2 bd., 2 ba., condo, fully equipped kitchen, TV, VCR, sleeps 6, air, newly remodeled, large pool, tennis, tropical restaurant, nr Manuel Antonio, next to river w/ mangroves and monkeys, close to beach, JPL rates. luisalfaro@earthlink.net or 760/723-8522.
- HAWAII, Kona, ocean front on Keauhou Bay, house and guest house comfortably sleep 6, 3 bd., 2 ba., rustic, relaxing and beautiful, swimming, snorkel-ing, fishing, spectacular view, near restaurants, golf and other attractions. 626/584-9632.
- HAWAII, Maui condo, NW coast, ocean front view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn. phone, color TV, VCR, microwave, d/w, pool, priv. lanai, slps 4, laundry fac., 4/15-12/14 \$105/nite/2, 12/15-4/14 \$120/nite/2, \$15/nite/ add'l person. 949-348-8047, jackandrandy@cox.net.
- MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equipped kitchen incl. microwave, D/W, cable TV, VCR, phone, balcony w/view to mtns., Jacuzzi, sauna, streams, fishponds, close to Mammoth Creek. JPL discount. 626/798-9222 or 626/794-0455.
- PUERTO VALLARTA, Villa del Mar, lg. studio slps 4, rooms have microwave, kitchen, phones, cable TV, private patio, 3 pools, 3 restaur., spa, priv. beach, charming town, top-rated resort, avail. only 12/28/02 - 1/4/03, on-site New Years Eve Fiesta, see at http://www.myuvc.com/puerto_vallarta.shtm. 541-1340.
- ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking, 626/794-3906.